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EXAMINER	
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ART UNIT	PAPER NUMBER
2617	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/612,438	HU ET AL.	
	Examiner	Art Unit	
	Shantell Heiber	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 August 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *7/2/03* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 28, 2007 has been entered.

Response to Arguments

2. Applicant's arguments filed on August 28, 2007 have been fully considered but they are not persuasive. The applicant argues that ***Tiedemann is completely silent regarding how power assignments and numbers of channelization codes are made. With respect to the claimed subject matter, Tiedemann includes absolutely no details regarding adjusting over a plurality of iterations the values for the portions of the available transmission power and the number of channelization codes*** (See page 14 of applicant's remarks) and ***Tiedemann simply does not employ a technique for assigning power fractions and channelization codes that is repeated over a plurality of iterations to optimize channel capacity*** (See page 15 of applicant's remarks). The examiner respectfully disagrees.

Tiedemann, Jr. et al. (Tiedemann) discloses other parameters that the base station can adjust in connection with allocating the unused power are the transmission rate and the code rate of the transmitted stream (prior iteration). The transmit power

level of the ABR traffic streams can be dynamically adjusted in order to maintain the output power constant. The total energy received per frame can be represented as Et/No. If there are N coded symbols per frame, each with equal Es/No, then: Et=N Es/No, where Es is the energy of a symbol. The EsNo that is received at the mobile station can be determined from PrC/No/R, where Pr is the received power, C is the code rate, and R is the transmission rate. The Es is the energy per symbol received on a code channel and Pr is the power received on the code channel. The transmit power of an ABR traffic stream is permitted to vary, either the bit rate or the received EsNo must vary. Rapid varying of the transmitted power of an ABR traffic stream is desired in order to maintain a high base station output power level. A base station can estimate the received (Et/No)rk at a mobile station based upon the amount of power transmitted on the code channel. If the base station transmits more energy than necessary in the early part of the frame, it can reduce the amount of energy later in the frame and apply the saved energy to the remaining code channels. See paragraphs [0036], [0041] and [0043]-[0049]. Therefore, Tiedemann discloses all limitations as presented in amended claims 1, 10, 16 and 28 clarifying the iterative technique and claims 2, 3, 13-15, 17-18 and 29 providing consistency with the respective independent claims.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-12, 14, 16-24, 26, 28 and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Tiedemann, Jr. et al. (Tiedemann), U.S. Publication No. 2002/00304170.

Regarding Claims 1, 10, 16 and 28, Tiedemann discloses a method of communication, comprising: assigning at least one channelization code to each of a plurality of data packets available for a current transmission **(inherent in a CDMA system; [0007])**; and allocating available transmission power to the channelization codes based on a plurality of channel quality metrics **(power is assigned to CBR, VBR and ABR traffic based on power needed for transmission and priority relative to quality of service; [0034])**, at least a subset of the channelization codes being assigned respective portions of the available power, wherein: the assigning and allocating further comprise evaluating a number representing how many channelization codes are to be assigned to each of the packets and evaluating the portion of the allocated transmission power to be assigned to each data packet using an iterative procedure that adjusts the values for the portions of the allocated transmission power and the number of channelization codes for at least one iteration responsive to the

channel quality metrics and the values for the portions of the allocated transmission power and the number of channelization codes determined during at least one prior iteration to optimize a capacity of a channel for communicating the data packets during the current transmission **[0036], [0041] and [0043]-[0049]**.

Regarding Claims 2, 17 and 18, Tiedemann discloses further comprising: determining the portions of the available power to be assigned based on the channel quality metrics and a first optimization parameter **(the base station determines which time frames have additional capacity available for transmission by comparing the power needed with the maximum output power value; [0034])**; determining the values of the number of channelization codes assigned to the data packets based on the determined portions of the available power and a second optimization parameter **(determining the power required to transmit each ABR stream and selecting one or more ABR streams with power requirements that are equal to the available capacity; [0035])**; and repeating over a plurality of iterations the determining of the portions of the available power and the determining of the values of the number of channelization codes **[0036], [0041] and [0043]-[0049]**.

Regarding Claims 3 and 29, Tiedemann discloses further comprising: determining the number of channelization codes assigned to each data packet based on a size of the data packet and one of the channel quality estimates associated with the data packet **(determining the power required to transmit each ABR stream and selecting one or more ABR streams with power requirements that are equal to the available capacity; [0035])**; determining the portions of the available power to be

assigned to each of the channelization codes based on a first optimization parameter **(the base station determines which time frames have additional capacity available for transmission by comparing the power needed with the maximum output power value; [0034])**; and repeating over a plurality of iterations the determining of the number of channelization codes and the determining of the portions of the available power **[0036], [0041] and [0043]-[0049]**.

Regarding Claims 4 and 19, Tiedemann discloses further comprising: terminating the repeating responsive to the assigned channelization codes in a first iteration being the same as the assigned channelization codes in a second later iteration **(the assigned channelization codes are inherently the same for VBR traffic streams 14e, 14f and they both require little power during the time frame 18e; [0032])**; and truncating the subset of assigned channelization codes based on a maximum number of allowable channelization codes **(a subset of channelization codes are assigned specifically to each CBR, VBR and ABR traffic streams)**.

Regarding Claims 5 and 20, Tiedemann discloses wherein optimizing the capacity further comprises optimizing a Shannon capacity **(inherent)** of the channel for communicating the data packets **(see rejections for claim 2)**.

Regarding Claims 6 and 21, Tiedemann discloses further comprising prioritizing the plurality of data packets **(the scheduling of transmissions are based on priority and quality of service requirements; [0034] and see rejections for claim 2)**.

Regarding Claims 7 and 22, Tiedemann discloses wherein prioritizing the plurality of data packets further comprises: identifying a plurality of quality of service classes **(CBR, VBR and ABR traffic streams; [0031-0033])**; assigning a predetermined amount of the available power to each of the quality of service classes **(power is assigned to each traffic stream for each time frame 18a-f; [0032-0034])**; and assigning the channelization codes and the portions of the available power based on the predetermined amounts for each quality of service classes **(power is first assigned to CBR and VBR traffic streams and the remaining unused power is used to schedule ABR transmissions; [0034] and [0035])**.

Regarding Claims 8 and 23, Tiedemann discloses wherein prioritizing the plurality of data packets further comprises: identifying a plurality of quality of service classes; assigning the channelization codes and the portions of the available power for a first class **(CBR and VBR traffic streams)** of the quality of service classes; determining a remaining amount of the available power after the assigning for the first class; and assigning the channelization codes and the portions of the available power for a second class **(ABR traffic streams)** of the quality of service classes based on the remaining amount of available power **(see rejections for claim 7)**.

Regarding Claims 9 and 24, Tiedemann discloses wherein prioritizing the plurality of data packets further comprises: identifying a plurality of quality of service classes; combining all data packets in the plurality of quality of service classes; sorting the combined users based on a fairness algorithm **(inherent when identifying a plurality of quality of service classes)**; and assigning the channelization codes and

the portions of the available power based on the sorting **(power is assigned based on availability and the quality of service classes) (see rejections for claim 7)**.

Regarding Claim 11, Tiedemann discloses further comprising initiating a communication link over a channel, the communication link being assigned to a quality of service class having a predetermined transmit power assignment and the power fraction is based on a portion of the predetermined transmit power **(the ABR traffic streams are assigned a predetermined transmit power based on the available remaining unused power; [0034] and [0035])**.

Regarding Claim 12, Tiedemann discloses wherein the channelization codes and the power fractions associated with the signal are assigned based on the channel quality estimate to optimize a Shannon capacity **(inherent)** of the channel **(see rejections for claims 10 and 11)**.

Regarding Claims 14 and 26, Tiedemann discloses wherein the first constraint and first optimization parameter are associated with the power available for communicating, and the channelization codes and power fractions associated with the signal are assigned by determining the portions of the available power to be assigned based on the first optimization parameter **(see rejections for claim 7)**.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made

to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 13, 15, 25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tiedemann.

- **Regarding Claims 13, 15, 25 and 27, Tiedemann discloses** wherein the channelization codes and power fractions associated with the signal are assigned by at least one of the channelization codes and the portions of power available for communicating based on the first optimization parameter as described above.

Tiedemann fails to specifically disclose further comprising: generating a cost function using a channel capacity equation having a first constraint, the cost function including a first optimization parameter associated with the first constraint; and determining a value for the first optimization parameter based on a first order derivative of the cost function. However, according to Tiedemann **[0005]-[0007]** cost is associated with each classification: CBR being the most expensive, VBR the next expensive and ABR the least expensive. Based on this priority list the portions of available power are assigned accordingly. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to determine the amount of power required for transmitting each code channel based upon priority so as to not exceed the total amount of power that the amplifier can provide without undesirable distortion **[0007]**.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hill et al., U.S. Patent No. 6,775,256 discloses a packet scheduler and method therefor.

Lundby et al., U.S. Patent No. 7,068,683 discloses a method and apparatus for high rate packet data and low delay data transmissions.

Hsu, U.S. Publication No. 2004/0090938 discloses a method of optimizing radiation pattern of smart antenna.

Ketchum, U.S. Patent No. 6,731,668 discloses a method and system for increased bandwidth efficiency multiple input-multiple output channels.

Bombay et al., U.S. Patent No. 6,999,517 discloses a method and apparatus for transmission of data on multiple propagation modes with far-end cross-talk cancellation.

Gollamudi et al., U.S. Publication No. 2003/0123477 discloses an adaptive quality control loop for link rate adaptation in data packet communications.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shantell Heiber whose telephone number is 571-272-0886. The examiner can normally be reached on Monday-Friday 7:00am-3:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester Kincaid can be reached on 571-272-7922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SLH

LESTER G. KINCAID
SUPERVISORY PRIMARY EXAMINER